

## COMPONENT DETERMINATION AND GAZE PROVOKED INTERACTION

### CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation-in-part of U.S. patent application Ser. No. 14/600,896 filed Jan. 20, 2015, entitled "COMPONENT DETERMINATION AND GAZE PROVOKED INTERACTION," the entire disclosure of which is hereby incorporated by reference, for all purposes, as if fully set forth herein.

[0002] U.S. patent application Ser. No. 14/600,896 is a continuation-in-part of U.S. patent application Ser. No. 14/547,087 filed Nov. 18, 2014, entitled "COMPONENT DETERMINATION AND GAZE PROVOKED INTERACTION," the entire disclosure of which is hereby incorporated by reference, for all purposes, as if fully set forth herein.

[0003] U.S. patent application Ser. No. 14/547,087 claims priority to Provisional U.S. Patent Application No. 61/905,536 filed Nov. 18, 2013, entitled "COMPONENT DETERMINATION AND GAZE PROVOKED INTERACTION," to which priority is also claimed in this application, and of which the entire disclosure is hereby incorporated by reference, for all purposes, as if fully set forth herein.

[0004] U.S. patent application Ser. No. 14/600,896 is also a continuation-in-part of U.S. patent application Ser. No. 14/547,089 filed Nov. 18, 2014, entitled "COMPONENT DETERMINATION AND GAZE PROVOKED INTERACTION," the entire disclosure of which is hereby incorporated by reference, for all purposes, as if fully set forth herein.

[0005] U.S. patent application Ser. No. 14/547,089 also claims priority to Provisional U.S. Patent Application No. 61/905,536 filed Nov. 18, 2013, entitled "COMPONENT DETERMINATION AND GAZE PROVOKED INTERACTION," to which priority is also claimed in this application, and of which the entire disclosure is hereby incorporated by reference, for all purposes, as if fully set forth herein.

### BACKGROUND OF THE INVENTION

[0006] The present invention generally relates to systems and methods for determining components for gaze provoked interactions and in particular, to systems and methods for performing gaze provoked interactions.

[0007] Detection of a user's gaze direction by an eye tracking device has enabled a new generation of computer input. As accuracy of eye tracking devices has improved, it is now possible to determine with good accuracy a point on a computer display at which a user is looking. This information can be used to drive a computer in whole, or at least in part.

[0008] There are specific advantages in combining gaze input with a physical or more traditional input such as a mouse, keyboard, touchpad, touchscreen, voice, or the like. This allows for a faster and more natural feeling interaction with a computer, as a user's gaze is usually a precursor to an action being performed on the computer. For example, a user will look at an icon before clicking it with a computer mouse. Knowing in advance the possibility of an action being performed advantageous for programs running on a computer.

[0009] However, there exist problems for implementing user-input schemes which take advantage of this additional gaze information. For example, different computer programs

and on-screen components behave differently. It may therefore be beneficial to tailor gaze interaction as dependent upon the context within which a user is interacting with a computer program.

[0010] Further, the type of interaction with the computer program or on-screen component potentially caused by a gaze interaction must be described or otherwise made known to the user. It provides a great advantage to a user if a gaze based interaction is enhanced or otherwise improved over a traditional interaction. In other words, to merely mimic a known and/or previously existing interaction by starting an interaction with a gaze of a user's eyes might not be as advantageous as a faster, more intuitive, and/or enhanced interaction.

[0011] Embodiments of the present invention provides solutions to these and other problems.

### BRIEF DESCRIPTION OF THE INVENTION

[0012] In one embodiment, a method for changing a display based at least in part on a gaze point of a user on the display is provided. The method may include receiving information identifying a location of the gaze point of the user on the display. The method may also include, based at least in part on the location of the gaze point, causing a virtual camera perspective to change, thereby causing content on the display associated with the virtual camera to change.

[0013] In another embodiment, a non-transitory machine readable medium is provided. The medium may have instructions stored thereon for changing a display based at least in part on a gaze point of a user on the display. The instructions may be executable by at least one processor for at least receiving information identifying a location of the gaze point of the user on the display. The instruction may also be executable for, based at least in part on the location of the gaze point, causing a virtual camera perspective to change, thereby causing content on the display associated with the virtual camera to change.

[0014] In another embodiment, a system for changing a display based at least in part on a gaze point of a user on the display is provided. The system may include an eye tracking device and a processor. The eye tracking device may be for determining a location of the gaze point of the user on the display. The processor may be for causing, based at least in part on the location of the gaze point, a virtual camera perspective to change, thereby causing content on the display associated with the virtual camera to change.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The present invention is described in conjunction with the appended figures:

[0016] FIG. 1 is a block diagram of one method of an embodiment of the invention for causing a zoom on a display based on a gaze input;

[0017] FIG. 2 is a block diagram of another method of an embodiment of the invention for causing a zoom on a display based on a gaze input;

[0018] FIG. 3 is a block diagram of a method of an embodiment of the invention for causing a scroll on a display based on a gaze input;

[0019] FIG. 4 is a block diagram of another method of an embodiment of the invention for causing a scroll on a display based on a gaze input;